# Tutorial: HTML5 video

**How to process and publish video in an open format**

Silvia Pfeiffer, Jan Gerber, Michael Dale

# Outline

Part 1: Basics

- Setup
- State of Standardisation
- Mediawiki/mwEmbed demo
- Editing
- Publish a HTML5 video
- <video> Javascript API
- Skinning
- Tinyvid.tv demo

# Outline

Part 2: Experts

- Transcoding
- Cross-Platform publishing
- Pad.ma demo
- Setting up a Site
- Accessibility
- In-browser video editing
- Other HTML5 video demos

# PART 1: BASICS

# Setup

- Ogg tools: oggz-tools, oggvideotools
  https://launchpad.net/~theora/+archive/ppa
- Web Server: Apache
- Web Browser: Firefox 3.6+, Opera 10.10
  https://launchpad.net/~ubuntu-mozilla-daily/+archive/ppa
- Firefogg: http://firefogg.org/
- Firebug: http://getfirebug.com
- Video Player: vlc, mplayer, totem, or xine
- Video Editor: pitivi or kino

Get content:

http://mirror.conf.lca2010.org.nz/lca-html5-tut-videos.tar.gz

# State of Standardisation

- HTML5 video and audio elements:
  http://www.whatwg.org/specs/web-apps/current-work/multipage/video.html
- Media Fragments URI:
  http://www.w3.org/2008/WebVideo/Fragments/WD-media-fragments-spec/
- Media Annotations API:
  http://dev.w3.org/2008/video/mediaann/mediaont-api-1.0/mediaont-api-1.0.html
- Timed Text: DFXP
  http://www.w3.org/TR/ttaf1-dfxp/

# Codecs in HTML5 Browsers

- Ogg Theora/Vorbis:
  - Firefox 3.5+ (liboggplay)
  - Chrome (ffmpeg)
  - Opera (gstreamer)
- MPEG-4 H.264/AAC:
  - Safari (QuickTime)
  - Chrome (ffmpeg)
  - Opera (gstreamer on Linux)

# Statistics of Browser support

- Ogg support through HTML5: 26.66% = 21.4% (FireFox3.5+) + 5.26 (Chrome3.0+)
- Ogg support through Cortado – Java plugin: 90%
- Adobe Flash Browser plugin: 99%
- Microsoft Silverlight Browser plugin: 48%
- QuickTime Browser plugin: 15%

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- Media Annotations API:
  http://dev.w3.org/2008/video/mediaann/mediaont-api-1.0/mediaont-api-1.0.html
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  http://www.w3.org/TR/ttaf1-dfxp/

# Media Fragments URI

Temporal:

- http://www.example.com/video.ogv#t=10,20

Live streaming:

- http://www.example.com/video.ogv#t=clock:2009-07-26T11:19:01Z,2009-07-26T11:20:01Z

Rectangular region:

- http://www.example.com/video.ogv#xywh=160,120,320,240

Track selection:

- http://www.example.com/video.ogv #track='video'

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# MediaAnn: API for metadata

```
object[] getProperty(
    in DOMString propertyName,
    in optional DOMString sourceFormat,
    in optional DOMString subtype,
    in optional DOMString language,
    in optional DOMstring fragment );
```

# MediaAnn: Properties

title: [“Video Stream”]
language: [“de-AT”] (BCP47)
locator: ["http://example.com/video.ogv"]
contributor, creator, createDate, location,
copyright, license, publisher, etc.
frameSize: [3.072, 2.304]
compression: [“Theora/Vorbis"]
duration: [3600]
format: [“video/ogg"]

# State of Standardisation

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- Media Annotations API:
  http://dev.w3.org/2008/video/mediaann/mediaont-api-1.0/mediaont-api-1.0.html
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# W3C Timed Text

DFXP: Distribution Format Exchange Profile

```
<tt xml:lang="" xmlns="http://www.w3.org/2006/10/ttaf1">
  <head>
    <metadata/>
    <styling/>
    <layout/>
  </head>
  <body region="subtitleArea">
    <div>
      <p xml:id="subtitle1" begin="0.76s" end="3.45s">It seems a
     paradox, does it not,</p>
      <p xml:id="subtitle2" begin="5.0s" end="10.0s">that the image
     formed on<br/>the Retina should be inverted?</p>
</tt>
```

# Reminder: Setup

- Ogg tools: oggz-tools, oggvideotools
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# Metavidwiki Demo

Michael Dale

# Editing

- Kino or pitivi – take DV input, write Ogg
  - Run kino on DVD_VR2.vob.dv
  - Cut a small segment
  - Export to Ogg
  - Test in vlc, mplayer, or xine

# Prepare an Ogg Video

- dvdrip, vobcopy – for DVDs to extract to DV (for editing) or mpeg
- Thoggen – for DVDs to extract to Ogg Theora
- dvgrab – for grabbing DV from a camera
- oggSlideshow was used for foms2009.ogv

- FFMpeg, ffmpeg2theora – transcode to Ogg
  - Go to http://firefogg.org/make/ and transcode DougSchepers-W3C.mp4 or ninja_gameplay.mp4
- oggThumb, totem – get poster image

# Prepare a Web page: page1.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>W3C News</title>
  </head>
  <body>
    <h2>Doug Schepers: W3C and Twitter</h2>
    <video src="DougSchepers-W3C.ogv"
poster="DougSchepers-W3C.png" controls>
      <p>Your browser does not support HTML5
Ogg video.</p>
    </video>
  </body>
</html>
```

# Publish Page

- Upload page1.html to apache
  - Copy page1.html to /var/www/
  - Make sure, Web server serves .ogv as video/ogg mime type out of /etc/mime.types
- Test in Firefox
  - http://localhost/page1.html

# Server improvements

- Improve speed:
  - create .htaccess file with:

    <Files "DougSchepers-W3C.ogv">

    Header set X-Content-Duration “55.48"

    </Files>
  - Use oggz-info to find out duration
- Improve seeking:
  - Install oggz-chop and set it up as cgi script

    ScriptAlias /oggz-chop /usr/bin/oggz-chop

    Action video/ogg /oggz-chop

# Publish in Ogg and MP4: page2.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>W3C News</title>
  </head>
  <body>
    <h2>Doug Schepers: W3C and Twitter</h2>
    <video   poster="DougSchepers-W3C.png" controls>
   <source src="DougSchepers-W3C.ogv" type="video/ogg" />
   <source src="DougSchepers-W3C.mp4" type="video/mp4" />
      <p>Your browser does not support HTML5 Ogg video.</p>
    </video>
  </body>
</html>
```

Test in Safari/Webkit on Mac to play the MP4

# Javascript API of <video>

- API functions:
  - v = new Video([url]);
  - void load();
  - void play();
  - void pause();
- Attributes e.g.:
  - DOMString src / currentSrc
  - float currenttime
  - float volume
  - boolean muted
- skinning

# Skinned video player examples


http://www.annodex.net/~silvia/itext/elephant_with_skin.html


http://openvideo.dailymotion.com/video/xbqpad_wallys-happy-place_fun

# Tinyvid.tv Demo

Created by Chris Double

# Part 2: Experts

# Transcoding: what bitrates?

- SD 240p (320x240 pixels, 4:3, CIF) – bitrate of 350Kbps to 500 Kbps
- SD 480p (640x480 pixels, 4:3) – bitrate of 500Kbps to 1.5Mbps
- HD 720p (1280x720 pixels, 16:9) – bitrate of 1 Mbps to 5Mbps
- HD 1080p (1920x1080 pixels, 16:9) – bitrate of 2Mbps to 10Mbps

14Mbps Telstra “Next G” HSPA wireless network
24Mbps for ADSL+

# Transcoding: high quality choice

- SD (4:3): 640x480 pixels, keep framerate, 1-2Mbps
- HD (16:9): 960x480 pixels, keep framerate, 1-2Mbps
- Audio: 44.1kHz+, stereo, 100-200Kbps

Possibly publish a high and a low quality video, so users can choose

# ffmpeg2theora

- Simple: ffmpeg2theora <file.dv>
  -> file.ogv
- Live encoding from dv camcorder:
  dvgrab - | ffmpeg2theora -f dv -x 960 -y 480 -o output.ogv –
- Interesting options:
  - --two-pass
  - --sync / --nosync
  - --preset: ffmpeg2theora -p info
  - Subtitles (see later)
- recent builds at http://firefogg.org/nightly/

# Transcode script: transcode.sh

```
tstart=$1
tend=$2
inputfile=$3
strdate=`date`;
strorga="LCA";
strcopy="LCA 2010";
strlicense="Creative Commons BY SA 2.5";
strcommand="ffmpeg2theora -s $tstart -e $tstop
--date '$strdate' --organization '$strorga'
--copyright '$strcopy' --license '$strlicense'
--sync $inputfile"
```

# Cross-Platform Video Publishing

- Ogg works out of the box on
  - Firefox 3.5+
  - Opera (latest beta 10.50)
  - Chrome 3.0+
- Safari: install XiphQT or use cortado
- IE: use cortado or vlc plugin (ActiveX control in development)

# Cortado Fallback: page3.html

```
<video src="big_buck_bunny_480p_stereo.ogv"
controls width="854" height="480">
<applet
code="com.fluendo.player.Cortado.class"
archive="http://theora.org/cortado.jar"
width="854" height="480">
<param name="url"
value="big_buck_bunny_480p_stereo.ogv"/>
<param name="duration" value="596.458"/>
</applet>
</video>
```

Run in IE on Windoze.

# Quicktime/Flash fallback

- Video for Everybody
  - Ogg
  - Mp4
  - QuickTime plugin
  - Flash plugin
  - Error message
- No Javascript necessary

# Video For Everybody: page4.html

```
<video poster="videos/ninja_gameplay.jpg" controls>
  <source src="videos/ninja_gameplay.ogv" type="video/ogg" />
  <source src="videos/ninja_gameplay.mp4" type="video/mp4" />
  <!--[if gt IE 6]>
    <object width="640" height="375"><![endif]-->
  <!--[if !IE]><!-->
    <object width="640" height="375" type="video/quicktime"
data="videos/ninja_gameplay.mp4">
  <!--<![endif]-->
  <param name="src" value="videos/ninja_gameplay.mp4" />
  <object width="640" height="380" type="application/x-shockwave-
flash"
data="http://www.vimeo.com/moogaloop_local.swf?clip_id=6716251">
    <param name="movie"
value="http://www.vimeo.com/moogaloop_local.swf?clip_id=6716251" />
    <p>No video playback capabilities</p>
  </object><!--[if gt IE 6]><!--></object><!--<![endif]-->
</video>
```

# Javascript Video Tag Rewrite

Use ogv & mp4 video

- Video4All: JS library
  - Flash fallback
- mwEmbed: JS library
  - Cortado, vlc
  - Flash Fallback with Kaltura player
  - ROE use
  - Skinning with jQuery-ui
  - Subtitle support

# mwEmbed example: page5.html

```
<html>
<head>
<script type="text/javascript"
src="http://firefogg.org/make/mwEmbed/mv_embed.js"></sc
ript>
</head>
<body>
<video durationHint="5“ poster=“thumb.jpg“
src=“video.ogv"></video>
</body>
</html>
```

http://www.firefogg.org/make/mwEmbed/example_usage/Player_Simple_Themable.html

# Pad.ma Demo

Jan Gerber

http://www.pad.ma/

# Setting up a Video Hosting Site

- Cost of hosting video - consider:
  - Storage cost
  - Application sw: e.g. videobin.org, mediawiki
  - Application integration with CMSes
    - http://drupal.org/project/video
    - videopress
    - implement modules!
  - Bandwidth needs
  - Transcoding CPU needs

# External Theora hosting

- archive.org
- commons.wikimedia.org
- tinyvid.tv
- videobin.org (GPL v3)
- oggify.com

“External Embedding” enabled by default

# Firefogg: page6.html

- Encoding and uploading at the same time, or
- Sending a multipart POST request once encoding is done

Nicer interface with progressbar: page7.html

```
<script type="text/javascript">
var ogg = new Firefogg();
function transcode () {
  if(ogg.selectVideo()) {
    var options = JSON.stringify({'maxSize': 320, 'videoBitrate':
500});
    ogg.encode(options);
    document.getElementById('message').innerHTML="please wait";
    var transcodeStatus = function() {
      if(ogg.state == 'encoding') {
        setTimeout(transcodeStatus, 500);
      } else if (ogg.state == 'encoding done') {
        document.getElementById('message').innerHTML="finished";
      }
    }
    transcodeStatus();
  }
  return false;
}
</script>

<p id="message"></p>
<a href="#" onclick="javascript:transcode()" >transcode file</a>
```

# Accessibility

- Player keyboard access
  - Tabbing
  - Space
  - Left/Right arrow (5 sec)
  - Ctl-Left/Ctl-Right arrow (60sec)
  - Home-Left/Home-Right (beginning/end)
  - Volume up / down arrows

# Captions/Subtitles: srt example

1
00:00:15,000 --> 00:00:17,951
At the left we can see...

2
00:00:18,166 --> 00:00:20,083
At the right we can see the...

3
00:00:20,119 --> 00:00:21,962
...the head-snarlers

http://www.annodex.net/~silvia/itext/elephants_dream/elephant.english-utf8.srt

# Sites that offer subtitles

- OpenSubtitles.org:
  - http://www.opensubtitles.org/en
- DivX Subtitles:
  - http://www.divxsubtitles.net/
- AllSubs.org:
  - http://www.allsubs.org/

# Subtitle example with HTML5

```
<video src="elephants_dream.ogv"
poster="elephants_dream.png" >
    <itextlist category="SUB">
      <itext lang="af" charset="ISO-8859-1“
          src="elephants_dream.afrikaans.srt“/>
      <itext lang="ar" charset="Windows-1256"
          src="elephants_dream.arabic.srt“/>
      <itext lang="bn" charset="UTF-8”
          src="elephants_dream.bangla.srt“/>
  </itextlist>
</video>
```

Demo:
http://www.annodex.net/~silvia/itext/elephant_no_skin_v2.html
Note: in process of standardisation

# Javascript subtitle approach

```
<script type="text/javascript"
src="jquery.js"></script>
<script type="text/javascript"
src="jquery.srt.js"></script>

<video src="http://example.com/video.ogv" id="video"
controls>
</video>
<div class="srt“ data-video="video"
     data-srt="http://example.com/video.srt" />
```

Demo: http://v2v.cc/~j/jquery.srt/

# Audio Descriptions

Demo:
http://au.youtube.com/watch?v=i2VXpoSoBLw

Textual audio descriptions:

- Run screenreader
- http://www.annodex.net/~silvia/itext/elephant_no_skin_v2.html
- http://www.annodex.net/~silvia/itext/elephants_dream/audiodescription.srt

# Ogg Kate

- Encapsulated text in Ogg
- ffmpeg2theora or kateence/oggz-merge:
  - Run “kateenc -t elephants_dream_1024.srt -l en -c SUB -o elephants_dream_1024.ogx”
  - Run “oggz-merge elephants_dream_1024.ogx elephants_dream_1024.ogv -o elephants_dream_1024_merged.ogv”

Demo: Firefox with Kate support (hack)

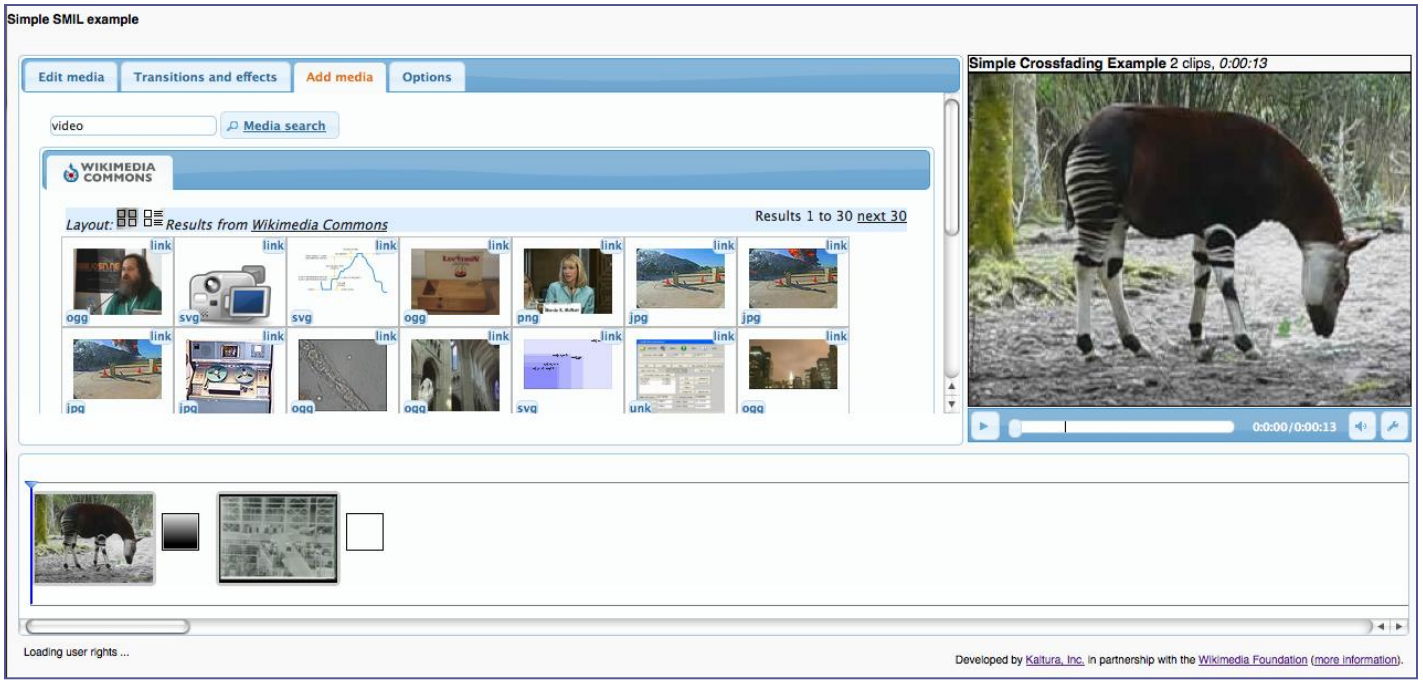
# Ogg Theora with Kate in Cortado

```
<applet
code="com.fluendo.player.Cortado.class"
archive="cortado.jar"
        width="512" height="288">
    <param name="url" value="video.ogv"/>
    <param name="kateLanguage" value="en">
</applet>
```

page8.html – test in IE on Win

http://people.xiph.org/~oggk/elephants_dream/elephantsdream.html

# In-Browser HTML5 video editing




http://sandbox.kaltura.com/testwiki/js2/mwEmbed/example_usage/Sequence_Editor.html

# Other HTML5 Demos

- Video and SVG:
  - http://www.double.co.nz/video_test/video.svg
  - http://people.mozilla.com/~prouget/demos/DynamicContentInjection/play.xhtml
- Video and CSS Transforms:
  - http://www.zachstronaut.com/lab/isocube.html
  - http://people.mozilla.com/~prouget/demos/round/index.xhtml
  - http://hacks.mozilla.org/2009/07/video-more-than-just-a-tag/
- Replace background with image
  - http://people.mozilla.com/~prouget/demos/green/green.xhtml

# References


- http://en.flossmanuals.net/TheoraCookbook/
- http://commons.wikimedia.org/wiki/Help:Converting_video
- http://free-electrons.com/community/videos/mini-howto/
- http://planet.xiph.org/
- http://gov2.net.au/projects/project-18/